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CCCCLXXIV.—TROPICAL FODDER GRASSES—(continued).

An account of tropical fodder grasses was given in the *Kew Bulletin*, 1894, pp. 373–387. The information contained in it has been reproduced in many colonies, and evidently supplied a long-felt want. In the present article particulars of two grasses are kindly furnished by Mr. John Bovell, F.C.S., Superintendent of the Dodd's Botanical Station at Barbados. The first of these is known locally as "Sour grass." **Andropogon pertusus**, *Willd.*, a native of the tropical parts of the Old World, but now quite naturalized in the West Indies. The history of its introduction is not known. In Duthie's *Fodder Grasses of Northern India* it is thus described :—

"*A pertusus*, Willd. Perennial. Stems creeping at the base, erect above, bearded at the nodes. This grass, which is met with all over the plains of Northern India, is universally esteemed as a good fodder grass, both for grazing and stacking. In Australia also it is highly valued, being regarded as one of the best grasses to stand long droughts, while it will bear any amount of feeding. It is useful also as a winter grass if the weather is not too severe."

In Watt's *Dictionary of the Economic Products of India*, Vol. I., p. 249, Dr. Stewart is quoted as follows :—

"It is considered excellent fodder for bullocks, &c., and for horses when green." While Mr. Coldstream, of Hissar, adds :—"Good for stacking, will remain for 12 or 13 years ; much stacked at the Hissar farm. Is especially grazed by buffaloes."

Dr. Voelcker in *Improvement of Indian Agriculture* (1893), p. 173, speaks of the same grass as follows :—

"Unless where distant forests are concerned, or where 'reserves' are sufficiently large to permit of grazing, I am in favour of grass being cut and removed rather than of its being fed off by stock. At *rukh* Jelleke (near Changa Manga) the people pay 1 rupee for the privilege of cutting and removing one head-load of grass each day during one month. At the Etawah 'reserve' the grass is cut by a contractor, and is sold on the spot for ¾ anna per head-load of about 100 lbs. ; this is sold at 2

annas in the village, and the price in Cawnpore is 6 annas. The grass is principally 'palwa' (*Andropogon pertusus*) a good feeding grass."

The success of this grass in Barbados is so marked as to attract general attention. Mr. C. A. Barber, F.L.S., late Superintendent of Agriculture in the Leeward Islands, in *Bulletin* XXXII., p. 168, states :—

"The appearance of the pastures in Barbados calls to mind more than anything I can remember in the tropics that of the English hay fields. The grass is clean and bright in colour. It is either grazed or regularly cut, and made into 'hay' for the cattle, or fed to them mixed with a little molasses and oil-cake. The grass universally used is the 'Sour grass.' This grass has been successfully introduced to the island of Nevis by the Hon. Joseph Briggs, where there are several fine fields of it already existing. For dry limestone soils this grass should prove of great value."

Mr. Bovell's account of Sour grass in Barbados is as follows :—

"The 'Sour grass' is the chief fodder grass of this island, where it is cultivated almost to the exclusion of all others. In the driest districts and on the most exposed places this hardy and excellent fodder plant, which grows from 18 inches to 2 feet high, seems to thrive and be at nome, furnishing at the time of the year when other fodder is scarce food for the animals employed on the sugar estates. If cut shortly after it flowers, just as the fruit is setting, it forms valuable food for horses, cattle, and mules, who then seem to eat it with relish ; but if it is allowed to get over-ripe the stems become hard and unpalatable, the animals then only eating the leaves and tender parts unless it is chaffed up and given them with the addition of oil-cake and molasses. It is propagated by root cuttings, the cuttings being placed in holes about one foot apart each way, when it soon spreads, covering the whole surface of the land. It goes on ratooning for many years, giving two, and sometimes three, cuttings annually. The yield varies with the soil, rainfall, and manurial treatment, but the average yield, without manure, may be set down from 5 to 7 tons per acre per annum; with the application of manure the yield is greatly increased, an acre then giving from 10 to 12 tons of fodder yearly. Until recently an acre of fairly good unmanured Sour grass was worth 3*l.* for the first cutting and 2*l.* for the second, the purchaser paying cost of cutting and loading ; lately, however, owing to the depreciation of the value of land, due to the fall in the price of sugar, an acre of Sour grass may be purchased for from 2*l.* to 4*l.* per acre for the two cuttings."

The second of the fodder grasses of Barbados is the "Hay-grass," Bouteloua juncifolia, *Lag.* (*B. litigiosa*, Lag.), a native of the West Indies and Central and South America. It is described by Grisebach (*Flora of the British West Indian Islands*, p. 537). It is found in Jamaica in the southern sandy districts, and is evidently a plant which thrives in hot dry plains. It has not hitherto been regarded as valuable for fodder purposes.

Mr. Bovell's account of it is as follows :—

"*Bouteloua juncifolia*, Lag.—A pasture grass growing in Barbados, principally on certain low-lying lands near the sea coast, where it affords excellent grazing during the rainy season, the animals, while it is obtainable, thriving on it without the addition of any other food; but

in the dry season it dies down, and the cattle would then starve had they nothing else to subsist on. In Barbados it is customary for those persons who rear cattle on the lands on which this grass is found, to take them to the sugar estates in the dry season, where they are fed on the tops of the sugar canes, which are at that time plentiful."

CCCCLXXV.—DIAGNOSES AFRICANÆ, VII.

(*Continued from p.* 153.)

The plants described below are the principal novelties of the collection of Somali-land plants briefly referred to in the current volume of the *Bulletin*, p. 158. Most of the plants were collected by Miss Edith Cole and Mrs. Lort Phillips, but these ladies were assisted by Mr. E. Lort Phillips, the leader of the expedition, and the other members of the party, Messrs. G. P. V. Aylmer and F. G. Gunnis, as well as by their native attendants, notably one Egga Nelayia. The country botanised lies immediately south of Berbera, extending to the Golis range of mountains, which rises to an altitude of 5900 feet; and it was here where the majority of the plants was collected. In this part the vegetation is luxuriant and varied, and there is evidently yet a rich field for the explorer. From a series of photographs brought home by the party, it is evident that the country in many places is covered with forest, the scenery is both curious and attractive, and the country generally is by no means of the desert character commonly assumed. The present collection consists of about 350 species, of which 69, including three new genera, were previously undescribed. Among the new generic types *Cyclocheilon* (*Scrophularineæ*) is the most noteworthy. It is distinguished by a very remarkable calyx, which is divided through the median plane, almost to the base, into two equal reniform-orbicular segments. Among the living plants and bulbs brought home by the party are several novelties, including one or two species of *Eulophia*, of which there are dried inflorescences. These will be described when they flower.

257. **Farsetia longistyla**, *Baker* [Cruciferæ]; annua, e basi ramosissima, caulibus gracilibus pilis albis adpressis strigosis, foliis caulinis remotis subsessilibus linearibus integris utrinque dense albo-strigosis, racemis laxissimis paucifloris, pedicellis brevibus ascendentibus strigosis, sepalis oblongis strigosis, petalorum limbo parvo oblongo purpureo, fructu lineari plano parce strigoso, valvis membranaceis nervo centrali obscuro præditis, stylo elongato, seminibus orbicularibus distincte alatis.

Habitat.—Somali-land: Goetten, *Miss Edith Cole, Mrs. Lort Phillips.*

Caulis sesquipedalis. *Folia* inferiora, 1½–2 poll. longa. *Sepala* 2 lin. longa. *Fructus* 9–12 lin. longus, 2 lin. latus. *Stylus* 2 lin. longus.

Near *F. stenoptera*, Hochst. (F. grandiflora, *Jaub. et Spach*) Differs by its smaller flowers and longer style.

258. **Polygala somaliensis**, *Baker* [Polygalaceæ]; perennis, glabra, ramulis firmis viridibus virgatis, foliis sparsis subsessilibus lanceolatis

acutis firmis uninerviis, racemis paucis multifloris laxis omnibus lateralibus, bracteis minutis caducis lanceolatis, sepalis exterioribus oblongis margine albidis interioribus oblongis obtusis albidis venis viridibus anastomosantibus, petalis albis sepalis interioribus æquilongis, fructu suborbiculari-compresso.

Habitat.—Somali-land: Golis range at Dara-as, *Miss Edith Cole.*

Folia inferiora 9–12 lin. longa. *Sepala* exteriora 1½ lin. longa, interiora 3½ lin. longa.

Nearly allied to *P. Fischeri*, Gürke.

259. **Arenaria vestita**, *Baker* [Caryophylleæ]; perennis, e basi ramosissima, caulibus diffusis gracilibus dense glanduloso-pubescentibus, foliis remotis sessilibus linearibus acutis pubescentibus, floribus in cymas laxas terminales dispositis, pedicellis elongatis, sepalis lanceolatis pubescentibus, petalis oblongis acutis rubellis sepalis æquilongis, staminibus petalis brevioribus antheris parvis oblongis, ovario globoso.

Habitat.—Somali-land: Golis range near Dara-as, alt. 5000 ft., *Miss Edith Cole, Mrs. Lort Phillips.*

Folia 6–9 lin. longa. *Sepala* et *petala* 2 lin. longa.

260. **Abutilon molle**, *Baker* [Malvaceæ]; fruticosum, ramulis pilis stellatis mollibus dense vestitis, foliis petiolatis cordato-orbicularibus cuspidatis argute dentatis utrinque dense molliter pilosis, floribus in paniculas laxas terminales dispositis, pedicellis erecto-patentibus, sepalis ovatis dense pilosis, petalis oblongis aurantiacis calyce triplo longioribus, carpellis 10 fructiferis apice minute cuspidatis ab axi demum secedentibus secus dorsum bifidis.

Habitat.—Somali-land: plains below the Golis range, *Miss Edith Cole, Mrs. Lort Phillips.*

Frutex 2–4 pedalis. *Folia* 1½–2½ poll. longa et lata. *Sepala* 2 lin. longa. *Petala* 6 lin. longa. *Carpella* fructifera 4 lin. longa.

Allied to *A. fruticosum*, Guill. et Perott.

261. **Hibiscus argutus**, *Baker* [Malvaceæ]; suffruticosus, ramulis virgatis lignosis pilis adpressis albidis strigosis, foliis breviter petiolatis oblongis acutis argute dentatis facie viridibus parce pilosis dorso dense pilosis venis elevatis, floribus ad axillas foliorum superiorum solitariis pedunculatis, bracteis multis setaceis hispidis calyce longioribus, sepalis ovatis, petalis oblongis coccineis calyce 6-plo longioribus, staminibus petalis paulo brevioribus antheris globosis luteis, stylis 5 elongatis patulis, stigmate parvo capitato.

Habitat.—Somali-land: Golis range, *Mrs. Lort Phillips.*

Folia inferiora 12-18 lin. longa. *Calyculi* bracteæ 3–4 lin. longæ. *Sepala* 1½ lin. longa. *Petala* 9–10 lin. longa. *Fructus* ignotus.

Near *H. micranthus*, L. & H. *crassinervius*, Hochst.

262. **Turræa lycioides**, *Baker* [Meliaceæ]; fruticosa, ramulis lignosis virgatis sursum pubescentibus, foliis sessilibus minutis oblanceolatis obtusis integris subcoriaceis utrinque obscure strigosis sæpe ad nodos fasciculatis, floribus axillaribus solitariis breviter pedunculatis, calycis pilosi tubo campanulato lobis parvis ovatis, petalis ligulatis calyce 6–8-plo longioribus, tubo filamentorum cylindrico petalis vix breviore, antheris ovatis ad faucem tubi sessilibus, stylo protruso apice stigmatoso ampulliformi.

Habitat.—Somali-land: Golis range at Dooloob, *Miss Edith Cole, Mrs. Lort Phillips.*

Folia majora 3–4 lin. longa. *Calyx* ½ lin. longus. *Petala* 3–4 lin. longa.

263. **Rhus myriantha**, *Baker* [Anacardiaceæ]; arborea, ramulis glabris, foliis petiolatis digitatim trifoliolatis rigide coriaceis glabris, foliolis oblongis obtusis integris penninerviis venulis primariis arcuatis ad marginem parallelis, foliolo centrali majore ad basin attenuato lateralibus inæquilateralibus, floribus in paniculam amplam terminalem ramulis compositis dispositis, pedicellis brevibus, bracteis ovatis minutis, sepalis ovatis parvis, fructu globoso nitido monospermo.

Habitat.—Somali-land: Golis range at Woob, *Mrs. Lort Phillips.*

Foliolum terminale 3–3½ poll. longum, 1½ poll. latum. *Panicula* pedalis, 9–10 poll. diam. *Fructus* 2 lin. diam.

264. **Lupinus somaliensis**, *Baker* [Leguminosæ]; perennis, ramulis dense pubescentibus, foliis longe petiolatis, stipulis setaceis magnis pubescentibus, foliolis 9–13 oblanceolatis obtusis minute cuspidatis facie viridibus glabris dorso molliter albo-pilosis, racemis multifloris superne densis, pedicellis brevibus erecto-patentibus, bracteis parvis dense pubescentibus, calycis dense molliter pilosi tubo brevissimo dentibus longis lanceolatis, petalis saturate cœruleis glabris calyce sesqui-longioribus, vexillo orbiculari, ovario cylindrico pubescente multiovulato.

Habitat.—Somali-land: rocks above Dara-as, Golis range, alt. 5000 ft., *Miss Edith Cole, Mrs. Lort Phillips.*

Foliolum centrale 2 poll. longum, 3–4 lin. latum. *Calyx* 6 lin. longus. *Corolla* 9 lin. longa. *Vexillum* 6 lin. latum. *Fructus* ignotus.

Near *L. varius* and *L. pilosus*, Linn.

265. **Crotalaria Phillipsiæ**, *Baker* [Leguminosæ]; fruticosa, ramulis gracilibus parce adpresse pilosis, stipulis parvis caducis, foliis petiolatis trifoliolatis facie viridibus glabris dorso adpresse pilosis, foliolis subsessilibus obovatis obtusis basi cuneatis, racemis laxis longe pedunculatis terminalibus et axillaribus, pedicellis brevibus, bracteis subulatis minutis, calycis pubescentis tubo campanulato dentibus lanceolatis vel deltoideis tubo æquilongis, petalis luteis glabris calyce duplo longioribus, vexillo obovato venis nigris multis percurso, ovario cylindrico multiovulato.

Habitat.—Somali-land: Golis range at Dara-as, *Mrs. Lort Phillips.*

Foliola 8–10 lin. longa et lata. *Calyx* 3 lin. longus. *Petala* 6 lin. longa. *Fructus* ignotus.

266. **Crotalaria aurantiaca**, *Baker* [Leguminosæ]; fruticosa, ramulis glabris, stipulis minutis caducis, petiolo elongato, foliis trifoliolatis firmulis utrinque viridibus glabris, foliolis linearibus obtusis minute cuspidatis brevissime petiolulatis, racemis laxis terminalibus pedunculatis, pedicellis calyce longioribus, bracteis minutis setaceis, calycis glabri tubo campanulato dentibus lanceolatis tubo æquilongis, petalis magnis aurantiacis glabris, ovario cylindrico glabro multiovulato, stylo elongato curvato.

Habitat.—Somali-land: Golis range at Hammar, *Miss Edith Cole, Mrs. Lort Phillips.*

Foliola 12–18 lin. longa, 3 lin. lata. *Petioli* interdum 3–4 poll. longi. *Calyx* 3 lin longus. *Petala* pollicaria; vexillum 9–10 lin. latum. *Stylus* 6–7 lin. longus. *Fructus* ignotus.

Near *C. intermedia*, Kotschy.

267. **Crotalaria leucoclada**, *Baker* [Leguminosæ]; fruticosa, ramulis lignosis dense persistenter albo-incanis, stipulis minutis lanceolatis pubescentibus deciduis, foliis longe petiolatis trifoliolatis utrinque viridibus obscure pubescentibus foliolis lineari-oblongis obtusis minute emarginatis basi attenuatis, floribus in racemos multifloros subdensos terminales dispositis, pedicellis erecto-patentibus incanis calyci æquilongis, bracteis minutis lanceolatis, calycis pubescentis tubo brevi campanulato dentibus lanceolatis vel lanceolato-deltoideis tubo longioribus, petalis aurantiacis glabris calyce 2–3-plo longioribus, vexillo obovato, carina alis paulo longiore, ovario cylindrico pubescente multiovulato, stylo elongato curvato glabro deorsum applanato.

Habitat.—Somali-land: Golis range, alt. 3000 ft., *Mrs. Lort Phillips.*

Foliolum terminale 9–12 lin. longum, 4 lin. latum. *Calyx* 3 lin. longus. *Petala* 6-7 lin. longa. *Fructus* ignotus.

Near *C. striata*, DC.

268. **Indigofera tritoides**, *Baker* [Leguminosæ]; herbacea, perennis, ubique persistenter albo-incana, caulibus primariis patulis ramosissimis, ramulis erecto-patentibus, stipulis lanceolatis persistentibus, foliis brevissime petiolatis digitatim trifoliolatis firmulis utrinque albo-incanis, foliolis oblanceolatis minute cuspidatis obscure petiolulatis e medio ad basin sensim attenuatis, racemis axillaribus densis longe pedunculatis, pedicellis calyci æquilongis, bracteis lanceolatis pilosis, calycis dense albo-strigosi tubo campanulato dentibus deltoideis tubo æquilongis, petalis rubellis glabris calyce 2–3-plo longioribus, ovario lineari multiovulato.

Habitat.—Somali-land: Golis range, near Dara-as, *Miss Edith Cole.*

Foliola 6–9 lin. longa, 1½–2 lin. lata. *Calyx* vix 1½ lin. longus. *Petala* 3 lin. longa. *Fructus* ignotus.

No other species with digitately trifoliolate leaves is known in Tropical Africa, but there are several at the Cape.

269. **Crassula Coleæ**, *Baker* [Crassulaceæ]; annua, erecta, e basi ramosa, caulibus brevibus fragilibus dense pubescentibus, foliis sessilibus oblongis acutis integris basi cuneatis carnosis utrinque viridibus dense pubescentibus, cymis laxis paucifloris terminalibus, pedicellis erectis elongatis pubescentibus, floribus pentameris, sepalis erectis pubescentibus lanceolatis basi coalitis, petalis oblongis rubellis calyce paulo longioribus, staminibus petalis paulo brevioribus, carpellis demum petalis æquilongis, stylis brevibus erectis, seminibus oblongis brunneis.

Habitat.—Somali-land: Golis range, near Dara-as, *Miss Edith Cole, Mrs. Lort Phillips.*

Folia inferiora 9–12 lin. longa, 3–4 lin. lata. *Calyx* 1½ lin. longus. *Petala* 2 lin. longa.

270. **Kalanchoe somaliensis**, *Baker* [Crassulaceæ]; perennis, carnosa, glabra, caule erecto stricto elongato, foliis crassis sessilibus inferioribus

obovato-cuneatis crenatis utrinque viridibus brunneo-marmoratis superioribus lanceolatis parvis, floribus in paniculam laxam corymbosam terminalem dispositis, pedicellis longis erectis, sepalis ovato-lanceolatis liberis, corollæ albæ tubo cylindrico elongato basi ventricoso lobis patulis ovato-lanceolatis, genitalibus in tubo inclusis.

Habitat.—Somali-land: Golis range, near Wardie, *Miss Edith Cole, Mrs. Lort Phillips.*

Folia inferiora 1½–2 poll. longa, 12–15 lin. lata. *Sepala* 3 lin. longa. *Corollæ* tubus 3–3½ poll. longus, basi 3–4 lin. diam.; lobi 6 lin. longi.

Near the Abyssinian *K. marmorata*, Baker (*K. grandiflora*, A. Rich. non W. & A.).

271. **Momordica dissecta**, *Baker* [Cucurbitaceæ]; perennis, e basi ramosissima, caulibus gracilibus glabris patulis, cirrhis parvis gracillimis simplicibus, foliis brevissime petiolatis deltoideis bipinnatis lobis lanceolatis vel oblongis basi attenuatis, floribus masculis lateralibus pedunculatis sæpissime solitariis, bracteis orbicularibus viridibus persistentibus, floribus in axillis bractearum subsessilibus, calycis lobis deltoideis tubo campanulato æquilongis, corollæ luteæ basi atropurpureæ lobis obovatis, floribus femineis fructuque ignotis.

Habitat.—Somali-land: Golis range at Djedainio, *Miss Edith Cole, Mrs. Lort Phillips.*

Folia 12–18 lin. longa et lata, lobis 1½–3 lin. latis. *Bracteæ* 6 lin. latæ. *Calyx* 2 lin. longus. *Corolla* pollicaris.

Nearly allied to *M. cissampeloides*, Klotzsch.

272. **Pentas glabrescens**, *Baker* [Rubiaceæ]; fruticosa, ramulis glabratis junioribus leviter pubescentibus, stipulis parvis deltoideis, foliis membranaceis oblongis acutis breviter petiolatis ad basin attenuatis utrinque viridibus facie glabris dorso obscure pubescentibus, floribus ad apices ramulorum paucis aggregatis, ovario oblongo, calycis lobis lanceolatis foliaceis, corollæ rubellæ tubo elongato cylindrico lobis patulis oblongis, antheris ex tubo protrusis.

Habitat.—Somali-land: Golis range, *Miss Edith Cole, Mrs. Lort Phillips.*

Folia majora 2 poll. longa, medio 8–9 lin. lata. *Calycis* lobi 2 lin. longi. *Corollæ* tubus pollicaris; lobi 4 lin. longi.

Differs mainly from *P. pauciflora* by its smaller more numerous flowers.

273. **Pentas pauciflora**, *Baker* [Rubiaceæ]; fruticosa, ramulis pubescentibus, stipulis deltoideis, foliis breviter petiolatis oblongis acutis ad basin attenuatis membranaceis utrinque viridibus obscure pubescentibus, floribus ad apices ramulorum solitariis vel paucis, ovario oblongo, calycis lobis magnis lanceolatis foliaceis pubescentibus, corollæ albæ tubo cylindrico elongato, limbi lobis 5 parvis oblongis, staminibus in tubo incluso, stylo protruso ramis cylindricis.

Habitat.—Somali-land: Golis range, near Goetten, *Miss Edith Cole.*

Folia majora 2–3 poll. longa, 12–15 lin. lata. *Calycis* lobi 3 lin. longi. *Corollæ* tubus 2½–3 poll. longus; lobi 3 lin. longi.

274. **Oldenlandia rotata**, *Baker* [Rubiaceæ] ; perennis, caulibus erectis strictis virgatis glabris, foliis in verticillis more Galii congestis sessilibus linearibus uninerviis patulis rigidulis glabris, floribus axillaribus pedunculatis solitariis vel geminis, ovario oblongo, calycis lobis 4 linearisubulatis ovario longioribus, corollæ albæ tubo cylindrico elongato lobis 4 patulis oblongo-lanceolatis, antheris ex tubo brevissime protrusis.

Habitat.—Somali-land : Golis range, *Miss Edith Cole*, *Mrs. Lort Phillips.*

Folia 12–18 lin. longa, ½–1 lin. lata. *Calycis* lobi 1½–2 lin. longi. *Corollæ* tubus 18 lin. longus ; lobi 4 lin. longi.

Combines the habit of a *Galium* with the floral structure of an *Oldenlandia.*

275. **Vernonia amplexicaulis**, *Baker* [Compositæ] ; fruticosa, ramulis persistenter albo-incanis, foliis tenuibus crenulatis facie viridibus obscure pubescentibus dorso dense pubescentibus junioribus albo-incanis superioribus oblongo-spathulatis amplexicaulibus inferioribus oblongis obtusis, petiolo ad basin anguste alato, capitulis multifloris purpureis paucis terminalibus corymbosis, pedunculis elongatis nudis albo-incanis, involucro campanulato bracteis lineari-subulatis multiseriatis dense pilosis intimis exceptis squarrosis, achænio angulato pubescente, pappi setis albidis corollæ tubo æquilongis.

Habitat.—Somali-land : Golis range, *Miss Edith Cole*, *Mrs. Lort Phillips.*

Folia inferiora 2–3 poll. longa. *Involucrum* 6 lin. diam. *Pappus* 2 lin. longus.

276. **Vernonia gomphophylla**, *Baker* [Compositæ]; fruticosa, ramosissima, ramulis lignosis albo-incanis, foliis alternis vel fasciculatis parvis obovatis integris emarginatis vel minute cuspidatis facie tenuiter dorso dense albo-incanis, capitulis paucis terminalibus umbellatis vel corymbosis, pedicellis pubescentibus erectis involucro longioribus, involucro campanulato multifloro bracteis pauciseriatis adpressis exterioribus ovatis pubescentibus interioribus glabris linearibus, achænio angulato pubescente, pappi setis firmulis albis corollæ tubo æquilongis.

Habitat.—Somali-land : Golis range, *Miss Edith Cole.*

Folia 4–6 lin. longa. *Involucrum*, 2 lin. diam., 1½ lin. longum *Pappus*, 1½ lin. longus.

Near the South Arabian *V. atriplicifolia*, Jaub. et Spach.

277. **Vernonia cryptocephala**, *Baker* [Compositæ] ; frutex parvus, ramulis dense persistenter albo-incanis, foliis sessilibus linearibus rigidis uninerviis confertis ascendentibus utrinque persistenter albo-incanis, capitulis magnis multifloris ad apices ramulorum sessilibus foliis subocculitis, involucro campanulato bracteis multiseriatis adpressis rigidis obtusis dorso incanis exterioribus sensim brevioribus, achænio angulato pubescente, pappi setis albis rigidulis tubo corollæ æquilongis.

Habitat.—Somali-land : Golis range, at Dara-as, alt. 5000 ft., *Miss Edith Cole, Mrs. Lort Phillips.*

Folia 6–8 lin. longa, 1 lin. lata. *Involucrum* 5–6 lin. diam. *Pappus* 3 lin. longus.

278. **Pulicaria Aylmeri**, *Baker* [Compositæ] ; fruticosa, ramosissima, ramulis subtiliter pubescentibus, foliis distincte petiolatis ovatis

profunde irregulariter crenatis utrinque viridibus pubescentibus, capitulis terminalibus solitariis vel paucis corymbosis, involucro campanulato bracteis pauciseriatis omnibus elongatis linearibus pilosis, floribus omnibus discoideis hermaphroditis, corollæ luteæ tubo cylindrico lobis minutis ovatis, achænio pubescente, pappi setis corollæ tubo æquilongis.

Habitat.—Somali-land: Golis range, Daimolek peak, alt. 4000 ft., *Mr. G. P. V. Aylmer.*

Folia 4–6 lin. longa. *Involucrum* 4 lin. longum. *Pappus* 3 lin. longus.

Near the Abyssinian *P. podophylla*, Jaub. et Spach.

279. **Senecio basipinnatus**, *Baker* [Compositæ]; fruticosus, sarmentosus, ramulis gracilibus glabris, foliis breviter petiolatis ovato-deltoideis membranaceis facie viridibus obscure pubescentibus dorso magis pubescentibus dentibus inæqualibus deltoideis inferioribus majoribus basi lyrato-pinnatis lobis basalibus quadratis, capitulis multifloris radiatis in paniculam laxam terminalem ramis corymbosis dispositis, pedicellis minute bracteatis ascendentibus vel cernuis, involucro campanulato leviter pubescente bracteis 10–12 linearibus exterioribus paucis parvis laxis, ligulis luteis involucro brevioribus, achænio glabro, pappo albo flexili.

Habitat.—Somali-land: Golis range, *Miss Edith Cole*, *Mrs. Lort Phillips.*

Folia inferiora 2–3 poll. longa. *Involucrum* 4 lin. diam. *Pappus* 2 lin. longus.

Nearly allied to *S. deltoideus*, Less.

280. **Senecio (Kleinia) longipes**, *Baker* [Compositæ]; caule crasso cylindrico inermi, foliis carnosis planis sessilibus oblongis acutis integris glabris apice deltoideis ad basin angustatis, pedunculo stricto erecto ad medium folio valde reducto solum prædito, capitulis 2 homogamis multifloris terminalibus magnis, involucro campanulato glabro bracteis circiter 12 erectis lanceolatis æqualibus apice et margine membranaceis dorso conspicue sulcatis, floribus fulvis, corollæ lobis lanceolatis, achænio cylindrico glabro, pappo albo flexili corollæ tubo æquilongo.

Habitat.—Somali-land: Golis range. *Miss Edith Cole.*

Folia majora 4–5 poll. longa, 1½ poll lata. *Pedunculus* pedalis et ultra. *Involucrum* 6–8 lin. diam., bracteis 5–6 lin. longis. *Corollæ* tubus 5–6 lin. longus; lobi 1 lin. longi.

281. **Senecio (Kleinia) Gunnisii**, *Baker* [Compositæ]; caule crasso cylindrico subdecumbente aculeis parvis conicis albidis armato, foliis nullis, pedunculis monocephalis gracilibus brevibus nudis, capitulis solitariis homogamis discoideis, involucro oblongo glabro bracteis 10–12 linearibus æqualibus erectis, floribus fulvis, achænio cylindrico glabro, pappo albo flexili corollæ tubo æquilongo.

Habitat.—Somali-land: Golis range, in dry sandy rocky ground, *Miss Edith Cole*, *Mrs. Lort Phillips.*

Caulis 4–6 lin. diam. *Pedunculi* 2–3 poll. longi. *Involucrum* 6 lin. diam., bracteis 8–9 lin. longis. *Pappus* 8 lin. longus.

282. **Carduncellus cryptocephalus**, *Baker* [Compositæ]; perennis, caulibus crebre foliatis, foliis sessilibus lanceolatis rigidis ascendentibus

spinis stramineis duris erecto-patentibus armatis apice pungentibus, capitulis magnis ad apices ramulorum sessilibus solitariis foliis ascendentibus occultis, involucro campanulato bracteis multiseriatis rigidis adpressis interioribus linearibus exterioribus infra spinam magnam pungentem obtusis, pappi setis interioribus mollibus elongatis plumosis exterioribus brevioribus lanceolatis cuspidatis.

Habitat.—Somali-land: Golis range, *Mrs. Lort Phillips.*

Folia inferiora 2 poll. longa, 2 lin. lata. *Involucrum* 6 lin. diam. *Pappus*, 6 lin. longus.

Adds this Mediterranean and Oriental genus to the Tropical African flora.

283. **Centaurea (Microlonchus) Aylmeri**, *Baker*, [Compositæ]; herbacea, perennis, foliis utrinque dense persistenter albo-incanis caulinis sessilibus linearibus integris basalibus rosulatis profunde pinnatifidis lobis linearibus, caule elongato incano monocephalo, pedunculo elongato nudo stricto, involucro campanulato, bracteis multiseriatis rigidis adpressis viridibus apice nigris acutis exterioribus ovatis intimis lanceolatis, corollis pallide rubris tubo cylindrico lobis linearibus, achænio piloso, pappi paleis multis linearibus obtusis achænio longioribus.

Habitat.—Somali-land: Golis range, alt. 5000 ft., *Mrs. Lort Phillips, Mr. G. P. Aylmer.*

Folia basalia 1½–2 poll. longa. *Involucrum*, 8 lin. diam., bracteis intimis 8–9 lin. longis. *Flores* exteriores 1 poll. longi. *Pappus* 2 lin. longus.

Near *C. somaliensis*, Oliver et Hiern.

284. **Statice xipholepis**, *Baker* [Plumbagineæ]; perennis, cæspitosa, basi suffruticosa, foliis radicalibus parvis rigide coriaceis albidis obovatis obtusis vel emarginatis in petiolum sensim angustatis, pedunculo brevi nudo, floribus 1–3-nis in spicis laxis paniculatis dispositis bracteis exterioribus parvis ovatis centralibus oblongo-lanceolatis navicularibus acuminatis duris persistentibus interioribus lanceolatis margine scariosis, calycis tubo cylindrico ore albo patulo scarioso dentibus 5 lanceolatis, petalis parvis oblongis obtusis integris lilacinis.

Habitat.—Somali-land: *Miss Edith Cole, Mrs. Lort Phillips.*

Folia cum petiolo 1½ poll. longa, 3-4 lin. lata. *Bracteæ* centrales 4–4½ lin. longæ. *Calycis* tubus 2 lin. longus.

Near *S. macrorhabdos*, Boiss. and *S. Griffithii*, Aitch. et Hemsl.

285. **Jasminum somaliense**, *Baker* [Oleaceæ]; fruticosum, sarmentosum, ramulis sursum pubescentibus, foliis petiolatis trifoliolatis subcoriaceis utrinque viridibus glabris, foliolis petiolulatis ovatis apice deltoideis basi late rotundatis, floribus in cymas corymbosas multifloras terminales aggregatis, pedicellis brevibus pubescentibus, bracteis parvis lanceolatis, calyce pubescente tubo campanulato dentibus deltoideis tubo brevioribus, corollæ tubo cylindrico calyce 8–9 plo longiori, lobis 5–6 oblanceolato-oblongis tubo distincte brevioribus, genitalibus in tubo inclusis.

Habitat.—Somali-land: Golis range at Dara-as, alt. 5000 ft., *Miss Edith Cole, Mrs. Lort Phillips.*

Foliola 12–18 lin. longa. *Calyx* 1 lin. longus. *Corollæ* tubus 9 lin. longus; lobi 6 lin. longi.

Near *J. mauritianum*, Bojer and *J. auriculatum*, Vahl.

286. **Asclepias Phillipsiæ**, *N. E. Brown* [Asclepiadeæ]; fruticosa ramosa, ramis incano-pubescentibus, foliis linearibus acutis parce puberulis, umbellis e nodis lateralibus pedunculatis 5–6 floris, pedunculis pedicellis bracteis linearibus acutis sepalis lanceolatis acuminatis incano-pubescentibus, corolla profunde 5-loba rotata lobis elliptico-ovatis acutis glabris in uno margine ciliatis, coronæ lobis paulo supra columnæ staminum basin exortis et columnæ apicem attingentibus complicatis subquadratis angulis rotundatis cum dentibus falcatis denticulatis abrupte reflexis ad angulos interiores intus ecornutis, folliculis lanceolatis acuminatis parce setosis puberulis.

Habitat.—Somali-land, without locality, *Mrs. Lort Phillips.*

Folia 1½–3½ poll. longa, ½-¾ lin. lata. *Pedunculi* 5–7 lin. longi. *Bracteæ* 2½–3½ lin. longæ. *Pedicelli* 4½–5 lin. longi. *Sepala* 1½–2⅓ lin. longa. *Corollæ* lobi 3 lin. longi, 1¾ lin. lati. *Coronæ* lobi 1–1¼ lin. longi, ¾ lin. lati.

287. **Asclepias integra**, *N. E. Brown* [Asclepiadeæ]; fruticosa ramosa, ramis erectis albis pedunculis pedicellis sepalis corollis que extus albo-tomentosis, foliis ascendentibus linearibus acutis mucronatis marginibus revolutis glabris junioribus albo-tomentosis, umbellis e nodis lateralibus pedunculatis 5–8-floris, sepalis ovatis vel ovato-lanceolatis acutis, corolla profunde 5-loba lobis elliptico-ovatis subacutis, coronæ lobis ad basin staminum columnæ vel paulo supra exortis et quam columna subduplo longioribus erectis complicatis oblique ovato-oblongis integris apice oblique rotundatis intus ecornutis, folliculis basi ovoideo-inflatis deinde in rostrum longum attenuatis junioribus albo-tomentosis demum pruinosis (vel glabratis?), seminibus rugosis.

Habitat.—Somali-land: Adda Gallah, *James & Thrupp;* Golis Range, *Mrs. Lort Phillips;* Hammar, *Miss Edith Cole.* Kilimanjaro: *Smith, Volkens* 567; Lanjora, 2000 ft., *Johnston.*

Frutex 4–5 ped. alta. *Folia* 2½–6 poll. longa, ½–1 lin. lata. *Pedunculi* ¾–1 poll. longi. *Pedicelli* 6–10 lin. longi. *Sepala* 1–1½ lin. longa, ½–¾ lin. lata. *Corollæ* lobi 3–5 lin. longi, 2–3 lin. lati. *Coronæ* lobi 2–3 lin. longi, 1½–2 lin. lati. *Folliculi* 1¾ poll. longi.

The corolla appears to be of a yellowish-white or greenish-white, and the corona brownish-ochre in the dried state.

288. **Caralluma Edithæ**, *N. E. Brown* [Asclepiadeæ]; ramis robustis erectis succulentis quadrangularibus glabris angulis grosse dentatis dentibus patentibus vel plus minusve retrorsis apice induratis, umbellis terminalibus globosis 60–70-floris, bracteis parvis subulatis, pedicellis glabris, sepalis subulatis attenuatis apice revolutis glabris, corollæ tubo brevi campanulato utrinque glabro lobis deltoideo-ovatis acutis patentibus extus glabris intus tuberculato-rugosis glabris ad apicem tantum penicillo pilorum instructis nec ciliatis, corona exteriore cupulari 5-loba glabra lobis bifidis segmentis subulatis basi contiguis deinde arcuato-divergentibus, coronæ exterioris lobis linearibus obtusis antheris incumbentibus coronæ exterioris dorso adnatis glabris.

Habitat.—Somali-land: *Miss Edith Cole.*

Rami 1 poll. crassi. *Pedicelli* 9 lin. longi. *Sepala* 2½–3 lin. longa. *Corollæ* lobi 2–2½ lin. longi et lati. *Coronæ* exterioris lobi ½–¾ lin. longi; coronæ interioris lobi ½ lin. longi.

A very fine species, very similar to *C. retrospiciens*, N. E. Brown, but the corolla is glabrous, with only a tuft of trembling hairs at the

very apex of the lobes, and the corona is also quite glabrous; the flowers are of a dark purple-brown.

289. **Edithcolea**, *N. E. Brown* [Asclepiadearum Stapeliearum genus novum]. *Calyx* 5-partitus. *Corollæ* tubus parvus; limbus magnus, rotatus, 5-lobus, lobi valvati. *Corona* duplex, columnæ staminum affixa; lobi coronæ exterioris breves, patentes, emarginato-bifidi, intus concavi vel saccati; lobi coronæ interioris antheris oppositi, erecti, lineares, apicibus triangulari-dilatis conniventibus echinulatis. *Columna staminea* prope basin corollæ affixa; antheræ erectæ, oblongæ, exappendiculatæ; pollinia in quoque loculo solitaria, erecta, apice pellucida. Stylus apice subcompressus, truncatus, brevissime bicorniculatis. Folliculos non vidi.—*Herba* succulenta, ramosa, aphylla, caules angulati, angulis spinoso-dentatis. *Flores* prope apicem ramorum enati, pedicillati, magni.

This genus is allied to *Caralluma*, but the very large corolla with a relatively very small tube, and somewhat different corona, easily distinguish it.

E. grandis, *N. E. Brown;* ramis basi decumbentibus pentagonis glabris angulis dentatis dentibus late deltoideis apice induratis pungentibus, floribus prope apicem ramorum subsolitariis, pedicello crasso glabro, sepalis ovato-lanceolatis accuminatis glabris, corollæ tubo parvo campanulato intus extusque glabro oris margine elevato plicato-rugoso, limbo maximo plano vel patelliformi usque ad medium 5-lobo extus glabro intus in disco concentrice lamellato-rugoso et lineis quinque radiantibus pilorum longorum clavato-capitatorum munito, lobis ovatis acutis vix rugosis a pilis tenuibus clavatisque hirtis atque ciliatis, coronæ exterioris lobis subpatentibus transverse oblongis emarginato-bifidis concavis intus hirtis, interioris erectis late linearibus basi gibbosis apice triangulari-dilatis inflexo-conniventibus echinulatis glabris quam columna staminum styloque multo longioribus.

Habitat.—Somali-land: Henweina Valley, about 3000 ft., *Miss Edith Cole, Mrs. Lort Phillips.*

Pedicelli 7–9 lin. longi, $1\frac{1}{4}$–$1\frac{1}{2}$ lin. crassi. *Sepala* 4 lin. longa, 1–$1\frac{1}{4}$ lin. lata. *Corolla* 4–5 poll. diam., tubo 3 lin. longo latoque, lobis $1\frac{1}{2}$–2 poll. longis, 1–$1\frac{1}{4}$ poll. latis. *Coronæ* exterioris lobi $\frac{1}{4}$–$\frac{1}{3}$ lin. longi, interioris lobi $\frac{3}{4}$ lin. longi.

Miss Cole states that the plant grows to about a foot in height, and that the branches are decumbent at the base and very stout, being an inch or more in diameter. The habit of the plant is something like that of *Stapelia gigantea*, N. E. Br.

290. **Heliotropium albo-hispidum**, *Baker* [Borragineæ]; perenne, caule basi lignoso ramosissimo, ramulis pilis albis hispidis adpressis dense vestitis, foliis sessilibus linearibus margine revolutis utrinque dense albo-hispidis, racemis laxis elongatis, bracteis lineari-subulatis persistentibus, pedicellis brevibus erectis, sepalis linearibus hispidis, corollæ tubo cylindrico calyci æquilongo intus dimidio superiore luteo-piloso, lobis minimis orbicularibus patulis antheris glabris subsessilibus lineari-oblongis, stylo in tubo incluso.

Habitat.—Somali-land: Golis range at Hammar, *Miss Edith Cole.*

Folia inferiora 6–9 lin. longa. *Calyx* $1\frac{1}{2}$ lin. longus. *Corollæ* limbus $1\frac{1}{2}$ lin. diam.

Near *H. strigosum*, Willd.

291. **Trichodesma stenosepalum**, *Baker* [Boragineæ]; suffruticosum, ramulis gracilibus albo-incanis sursum setis albidis erecto-patentibus hispidis, foliis caulinis parvis sessilibus oblanceolatis integris margine revolutis setis albis utrinque dense hispidis, cymis brevibus paucifloris terminalibus ramosis, pedicellis calyce longioribus, bracteis parvis linearibus, calycis tubo brevissimo segmentis linearibus dense hispidis, corollæ tubo brevi lobis lanceolatis acuminatis, antheris glabris appendicibus rectis.

Habitat.—Somali-land: Golis range, *Miss Edith Cole.*

Folia inferiora 5–6 lin. longa. *Calyx* 3 lin. longus. *Corolla* 4 lin. longa.

Near *T. heliocharis*, S. Moore.

292. **Convolvulus sphærophorus**, *Baker* [Convolvulaceæ]; annua, caulibus brevibus gracilibus patulis vel suberectis pubescentibus, foliis inferioribus breviter petiolatis lineari-oblongis integris basi attenuatis utrinque tenuiter pilosis superioribus oblongis obtusis basi rotundatis, floribus in glomerulos sessiles terminales et laterales dense molliter albo-pilosos aggregatis, sepalis lineari-oblongis, corolla late infundibulari sepalis paulo longiore limbo patulo vix lobato, staminibus corolla paulo brevioribus.

Habitat.—Somali-land: foot of Golis range, alt. 1200 ft., *Miss Edith Cole.*

Folia inferiora 9–12 lin. longa, superiora 3–4 lin. longa. *Sepala* 2 lin. longa. *Corollæ* limbus 3 lin. diam.

Near *C. glomeratus*, Choisy.

293. **Convolvulus (Astrochlæna) Phillipsiæ**, *Baker* [Convolvulaceæ); perennis, sarmentosa, caulibus sterilibus pilis stellatis albidis dense vestitis, foliis late ovatis cordatis integris facie tenuiter dorso dense albido-incanis, floribus in axillis foliorum solitariis vel geminis breviter pedunculatis, sepalis ovato-oblongis obtusis imbricatis dorso dense incanis, corollæ lilacinæ tubo oblongo extus glabro limbo patulo obscure lobato, genitalibus in tubo inclusis, staminibus inæqualibus, stylo staminibus longioribus breviore lobis stigmatosis oblongis patulis.

Habitat.—Somali-land: Golis range (the type and a variety with short suberect stems and smaller flowers), *Mrs. Lort Phillips.*

Folia majora 1½ poll. longa et lata. *Sepala* 2–2½ lin. longa. *Corollæ* limbus expansus 15 lin. diam.; tubus 9 lin. longus.

Near *C. malvaceus*, Oliver and *C. hyoscyamoides*, Vatke.

294. **Ipomœa (Orthipomœa) cicatricosa**, *Baker* [Convolvulaceæ]; fruticosa, caulibus argenteo-incanis cicatricibus foliorum delapsorum rugosis, foliis breviter petiolatis ovatis obtusis integris basi rotundatis facie viridibus obscure canescentibus dorso persistenter argenteo-incanis, floribus sessilibus in axillis foliorum solitariis, sepalis subæqualibus lanceolatis dense albo-sericeis, corollæ tubo oblongo rubro-purpureo extus sericeo limbo obscure lobato, staminibus corolla 3–4–plo brevioribus.

Habitat.—Somali-land: Golis range, *Miss Edith Cole*, *Mrs. Lort Phillips.* Adda Galla, *James* and *Thrupp.*

Folia 12–15 lin. longa, 8–9 lin. lata. *Sepala* 3 lin. longa. *Corolla* 18–21 lin. longa.

295. Ipomœa (Strophipomœa) heterosepala, *Baker* [Convolvulaceæ]; late volubilis, caulibus gracilibus pubescentibus, foliis longe petiolatis cordato-ovatis acuminatis membranaceis utrinque viridibus tenuiter pubescentibus, floribus solitariis axillaribus breviter pedunculatis, sepalis inæqualibus membranaceis acutis pubescentibus exterioribus cordato-ovatis, corollæ tubo extus pubescente late infundibulari calyce quadruplo longiore limbo patulo vix lobato, stylo corolla duplo breviore.

Habitat.—Somali-land: Golis range at Dara-as, *Miss Edith Cole, Mrs. Lort Phillips.*

Folia majora 3–4 poll. longa, 2½–3 poll. lata. *Sepala* 6–7 lin. longa. *Corolla* 2 poll. longa.

Near *I. sagittata*, Ker (Bot. Reg. tab. 437).

296. Verbascum (Lychnitis) somaliense, *Baker* [Scrophularineæ]; caule stricto elato stellato-pubescente, foliis utrinque dense persistenter albido-pannosis inferioribus majoribus petiolatis oblongis obtusis crenulatis basi cuneatis superioribus parvis sessilibus cordato-ovatis acutis, paniculæ ramis elongatis dense pubescentibus, floribus solitariis vel glomeratis sessilibus vel brevissime pedicellatis, bracteis ovatis acutis foliaceis pannosis, sepalis ovato-lanceolatis acutis dense pannosis, corollæ luteæ tubo campanulato lobis orbicularibus tubo æquilongis, staminibus brevibus antheris 4 reniformibus terminalibus, fructu globoso piloso.

Habitat.—Somali-land: Golis range, *Miss Edith Cole, Mrs. Lort Phillips.* Native name, Balamha.

Folia inferiora 9–10 poll. longa. *Calyx* 3 lin. longus. *Corollæ* limbus 5 lin. diam.

Near *V. sinaiticum*, Benth.

297. Linaria patula, *Baker* [Scrophularineæ]; perennis, diffusa, glabra, caulibus rectis gracilibus ramosis, foliis brevissime petiolatis remotis linearibus integris patulis firmulis utrinque viridibus basi angustatis, floribus ad axillas foliorum solitariis longe pedunculatis, sepalis lanceolatis margine scariosis albis, corolla magna lutea calcare ad apicem sensim attenuato labiis brevibus superiore rotundato integro inferiore trilobato palato citrino piloso, fructu globoso.

Habitat.—Somali-land: Golis range near Widaba, *Miss Edith Cole, Mrs. Lort Phillips.*

Folia 1–2 poll. longa. *Sepala* 1½ lin. longa. *Corolla* 10–12 lin. longa. *Fructus* magnitudine pisi.

Belongs to the section *Elatinoides*, near *L. macilenta*, Decne.

298. Cyclocheilon, *Oliv.* [Scrophularinearum-Gerardiearum genus novum]. *Calyx* herbaceus, subtubulosus, lateraliter bilabiatus vel potius in plano mediano fere bipartitus, labiis vel segmentis reniformi-orbiculatis integerrimis. *Corolla* bilabiata, calycem superans tubo oblique ampliato, labio superiore bilobato, labio inferiore trilobato, lobis patentibus omnibus subæqualibus rotundatis, lobo centrali labii inferioris cæteris paullo minore. *Stamina* didynama, inclusa; filamenta laxe pilosa; antheræ liberæ, glabræ v. basi tantum pilosæ, loculis æqualibus divergentibus breviter mucronatis. *Ovarium* biloculare, glabrum, ovoideo-globosum, compressiusculum; ovula anatropa in loculis geminata, oblique collateralia; stylus gracilis, apice oblique stigmatiferus. *Capsula* * * *

C. somaliense, *Oliv.*; fruticulosum divaricatim ramosum, ramulis rectis pilis brevibus albidis patentibus cano-hispidulis, foliis oppositis parvis breviter petiolatis oblanceolatis obovatis v. ellipticis obtusis integris hispidulis, floribus in axillis foliorum solitariis breviter pedunculatis bibracteolatis, bracteolis obovato-rotundatis parvis calycis segmentis arcte applicitis.

Habitat.—Somali-land: *Mrs. Lort Phillips.*

Folia 2 lin. longa, 1 lin. lata. *Calycis* lobi 4–5 lin. diam. *Corolla* 6 lin. longa; lobi 3 lin. lati.

299. **Phillipsia**, *Rolfe* [Acanthacearum genus novum]. *Calyx* elongato-tubulosus, 5-angulatus, apice 5-dentatus. *Corollæ* tubus longe cylindraceus, apice in faucem brevem paululo ampliatus; limbus subæqualis, patens, lobis 5 brevibus rotundatis contortis. *Stamina* 4, subæqualia, ad medium faucis affixa, subexserta, filamentis gracilibus, antheræ oblongæ, loculis æqualibus parallelis muticis. *Discus* inconspicuus. *Stylus* gracilis, apice crassiusculus; ovula in quoque loculo 2. *Capsula* calyce clauso inclusa, oblongo-linearis, acuta. *Semina* 4, plano-compressa, retinaculo brevi fulta.

P. fruticulosa, *Rolfe*; herba perennis ramosa v. fruticulosa, ramulis tetragonis cinereis asperulis, foliis breviter petiolatis suborbicularibus obscure crenulatis minute pubescentibus pilis curvatis, floribus axillaribus solitariis subsessilibus, bracteolis linearibus parvis.

Habitat.—Somali-land: Golis range, *Mrs. Lort Phillips.*

Folia 2–5 lin. longa. *Calyx* 5–7 lin. longus; lobi 1½–2 lin. longi. *Corollæ* tubus 9 lin. longus; lobi 2 lin. longi. *Capsula* 5–6 lin. longa.

A very distinct genus belonging to the tribe *Ruellieæ*, allied to *Satanocrater* and *Physacanthus*, but readily distinguished by the narrow tubular calyx, shrubby habit and very small leaves. The corolla is most like the latter genus, but has much smaller lobes. The habit is peculiar in the group, and, like the Arabian genus *Bentia*, in the tribe *Justicieæ*, is evidently an adaptation to the dry climate.

300. **Asystasia Coleæ**, *Rolfe* [Acanthaceæ]; herba diffusa, ramis tetragonis pubescentibus, foliis petiolatis ovatis v. elliptico-ovatis obtusis v. subobtusis repando-crenulatis pubescentibus, floribus in spicis terminalibus dispositis, bracteis ovato-lanceolatis acutis pubescentibus, bracteolis paulo parvioribus, calycis tubo brevissimo lobis lineari-lanceolatis acuminatis pubescentibus, corollæ tubo subcampanulato basi paulo contracto intus nervis barbatis lobis inæqualibus rotundatis patentibus, staminibus brevibus filamentis barbatis, ovario hirsuto, stylo apice glabro, stigmate bidenticulato, capsula oblonga acuta stipitata, seminibus 4 suborbiculatis plano-compressis rugulosis cinereis.

Habitat.—Somali-land: Golis range, *Mrs. Lort Phillips*, *Miss Edith Cole*. Adda Galla, *James* and *Thrupp*.

Folia ½–3 poll. longa, ¼–1½ poll. lata; petiolus 2–8 lin. longus. *Spicæ* 1–2½ poll. longæ. *Bracteæ* 6–9 lin. longæ. *Bracteolæ* 5–7 lin. longæ. *Calyx* 4–5 lin. longus, *Corolla* ¾–1 poll. longa. *Capsulæ* 10–12 lin. longæ. *Semina* 2 lin. lata.

Allied to *Asystasia rostrata*, Solms, but a stouter plant, with much larger flowers and fruit.

301. **Lantana concinna**, *Baker* [Verbenaceæ]; fruticosa, ramosissima, ramulis gracillimis pubescentibus, foliis oppositis petiolatis ovatis

crenatis rugosis utrinque viridibus supra obscure subtus dense pubescentibus, capitulis globosis ad axillas foliorum solitariis longe pedunculatis, bracteis oblongis foliaceis pubescentibus ascendentibus, calyce parvo, corollæ tubo cylindrico piloso lobis orbicularibus patulis.

Habitat.—Somali-land: Golis range, near Widaba, *Miss Edith Cole*, *Mrs. Lort Phillips.*

Folia 6–9 lin. longa. *Capitula* 5–6 lin. diam., bracteis 3 lin. longis. *Pedunculi* 1–2 poll. longi. *Corollæ* tubus 2 lin. longus.

Near L. *microphylla*, Franchet Sert, Somal. 49.

302. **Ocimum staminosum**, *Baker* [Labiatæ]; suffruticosum, ramulis pilis albis brevibus patulis vestitis, foliis petiolatis ovato-oblongis subintegris vel obscure crenulatis utrinque pubescentibus, racemis laxis elongatis, verticillastris pauciflоris, pedicellis brevissimis demum deflexis, bracteis parvis oblongis foliaceis persistentibus, calyce piloso tubo campanulato dente superiore orbiculari decurrente reliquis brevibus cuspidatis, corollæ tubo cylindrico calyci æquilongo labio superiore oblongo inferiore superiore paulo longiore, staminibus exsertis filamentis glabris basi haud appendiculatis, stylo staminibus longiore.

Habitat.—Somali-land: Golis range, Sheik's pass, alt. 3000–4000 ft., *Miss Edith Cole.*

Folia inferiora 1½–2 poll. longa. *Calyx* fructiferus 2 lin. longus. *Corolla* 4 lin. longa. *Stamina* 4 lin. longa.

Habit of the Abyssinian *O. menthæfolium*, Hochst.

303. **Ocimum verticillifolium**, *Baker* [Labiatæ]; fruticosum, ramulis adpresse pubescentibus, foliis subsessilibus linearibus integris acutis rigidulis ad basin sensim attenuatis utrinque viridibus obscure pubescentibus sæpissime in verticillos fasciculatis, racemis laxis simplicibus terminalibus, verticillastris 5–6-floris, pedicellis brevissimis, bracteis minutis, calycis pubescenti tubo campanulato dente superiore orbiculari-decurrente lateralibus subnullis inferioribus parvis subulatis, corollæ tubo calyci florifero æquilongo labiis tubo brevioribus, staminibus longe exsertis filamentis basi haud appendiculatis.

Habitat.—Somali-land: Golis range at Guldoo Hammed, *Miss Edith Cole*, *Mrs. Lort Phillips.*

Suffrutex bipedalis. *Folia* centralia 6–9 lin. longa, ¾ lin. lata. *Calyx* demum 3 lin. longus. *Corolla* 4 lin. longa. *Stamina* 9–12 lin. longa.

304. **Coleus vestitus**, *Baker* [Labiatæ]; perennis, ramis pilis albis patulis dense vestitis, foliis petiolatis ovatis crenatis crassiusculis utrinque dense pubescentibus, racemis laxis elongatis, verticillastris 5–6-floris, pedicellis calyci florifero æquilongis, bracteis parvis ovatis foliaceis, calycis pubescentis tubo campanulato dentibus tubo æquilongis supremo ovato reliquiis lanceolatis, corollæ tubo calyci florifero æquilongo labio superiori parvo orbiculari inferiore magno oblongo-naviculari unguiculato, staminibus labio inferiori æquilongis.

Habitat.—Somali-land: Golis range, alt. 3000 feet, *Miss Edith Cole*, *Mrs. Lort Phillips.*

Folia 1–1½ poll longa. *Calyx* fructiferus 2½–3 lin. longus. *Corollæ* labium inferum 5–6 lin. longum.

Near *C. barbatus*, Benth. and *C. lanuginosus*, Hochst.

305. **Coleus gomphophyllus,** *Baker* [Labiatæ]; perennis, ramis dense pubescentibus, foliis distincte petiolatis obovato-cuneatis leviter crenatis membranaceis utrinque pubescentibus, racemis laxis elongatis, verticillastris ebracteatis 10–12-floris, pedicellis calyce longioribus, calycis pubescentis tubo campanulato dente supremo ovato acuto marginibus decurrentibus dentibus inferioribus lanceolato-deltoideis supremo æquilongis, corollæ tubo calyci florifero æquilongo labio superiore parvo inferiore magno oblongo-naviculari, staminibus labio inferiore brevioribus.

Habitat.—Somali-land: Golis range, *Mrs. Lort Phillips.*

Folia inferiora 1½–2 poll. longa. *Calyx* fructiferus 3 lin. longus. *Corollæ* labium inferum 4–5 lin. longum.

Near *C. lanuginosus*, Hochst. and *C. barbatus*, Benth.

306. **Orthosiphon calaminthoides,** *Baker* [Labiatæ]; suffruticosum, ramosissimum, ramulis pubescentibus, foliis parvis petiolatis ovatis subobtusis crenatis utrinque viridibus pubescentibus, racemo simplice laxo elongato, verticillastris 2–6-floris, pedicellis calyce longioribus, bracteis minutis, calyce pubescente tubo cylindrico dentibus omnibus perparvis superioribus ovatis obtusis infimo lineari, corollæ tubo cylindrico calyce duplo longiori labiis parvis superiore minore inferiore lingulato, staminibus labio inferiore brevioribus, stylo apice stigmatoso integro.

Habitat.—Somali-land: Golis range, *Mrs. Lort Phillips.*

Folia 4–5 lin. longa. *Calyx* floriferus 1½ lin. longus. *Corollæ* tubus 3 lin. longus, labium inferum 1½ lin. longum.

307. **Orthosiphon molle,** *Baker* [Labiatæ]; perenne, ramulis dense pubescentibus, foliis breviter petiolatis ovatis obtusis crenatis basi late rotundatis utrinque dense pubescentibus, racemo laxo simplici, verticillastris 5–6-floris, pedicellis brevibus, bracteis minutis, calycis pubescenti tubo campanulato dente supremo ovato lateralibus lanceolato-deltoideis infimis parvis lanceolatis, corollæ tubo subcylindrico pubescente calyce florifero triplo longiore lobis parvis oblongis, staminibus labio inferiore vix brevioribus.

Habitat.—Somali-land: Golis range, *Mrs. Lort Phillips.*

Folia 3–4 lin. longa. *Calyx* floriferus 1 lin. longus. *Corollæ* tubus 3 lin. longus, labiis 1 lin. longis.

308. **Ballota fruticosa,** *Baker* [Labiatæ]; fruticosa, ramosissima, ramulis dense albido-incanis, foliis minutis petiolatis orbicularibus crenatis subcoriaceis supra viridibus obscure pubescentibus subtus dense persistenter albo-incanis venis primariis elevatis, floribus solitariis sessilibus axillaribus, calycis tubo infundibulari 10-costato limbo obliquo lato breviter dentato demum patulo scarioso.

Habitat.—Somali-land: Golis range, *Miss Edith Cole.*

Folia 2 lin. longa et lata. *Calyx* fructiferus 6 lin. longus, limbo 4 lin. diam. *Corolla* ignota.

309. **Leucas (Ortholeucas) Jamesii,** *Baker* [Labiatæ]; suffruticosa, ramulis pubescentibus, foliis distincte petiolatis lanceolatis vel oblongo-lanceolatis acutis integris supra tenuiter subtus dense pubescentibus, verticillastris multifloris distantibus foliis magnis suffultis, pedicellis brevibus, bracteis propriis subulatis minutis, calycis tubo infundibulari

incano 10 costato ore æquali dentibus parvis deltoideis, corollæ tubo cylindrico calyci æquilongo labio superiore oblongo dense piloso tubo æquilongo labio inferiore breviore, staminibus inclusis.

Habitat.—Somali-land: Golis range, *Miss Edith Cole*, *Mrs. Lort Phillips*. Collected previously by *James* and *Thrupp*.

Folia inferiora 2–2½ poll. longa, medio 6 lin. lata. *Calyx* 2 lin. longus.

310. Leucas (Loxostoma) paucijuga, *Baker* [Labiatæ]; perennis, caulibus gracilibus pubescentibus, foliis paucis remotis ovatis profunde crenatis basi rotundatis utrinque viridibus pubescentibus, verticillastris paucis paucifloris foliis magnis suffultis, pedicellis, subnullis, bracteis propriis parvis rigidis lineari-subulatis, calycis tubo infundibulari 10-costato piloso ore obliquo latere inferiore producto dentibus parvis deltoideis, corollæ tubo cylindrico calyci æquilongo labio superiore lingulato tubo æquilongo extus dense piloso inferiore parvo, staminibus labio superiori æquilongis.

Habitat.—Somali-land: Golis range, *Mrs. Lort Phillips*.

Folia 9–12 lin. longa. *Calyx* 4 lin. longus. *Corollæ* labium superum 3–4 lin. longum.

Near *L. microphylla*, Vatke.

311. Leucas (Loxostoma) thymoides, *Baker* [Labiatæ]: perennis, ramulis gracilibus pubescentibus, foliis parvis ovatis crenatis petiolatis utrinque dense pubescentibus, verticillastris paucis paucifloris foliis parvis suffultis, pedicellis brevissimis, bracteis propriis minutis subulatis rigidis, calycis tubo infundibulari piloso 10–costato ore obliquo latere inferiore producto dentibus lanceolatis parvis, corollæ tubo cylindrico labio superiore lingulato tubo æquilongo extus dense albo-piloso labio inferiore breviore trilobato, staminibus corollæ labio superiori æquilongis.

Habitat.—Somali-land: Golis range, *Mrs. Lort Phillips*.

Folia 3–4 lin. longa. *Calyx* 4 lin. longus. *Corolla* 7–8 lin. longa.

This also is nearly allied to *L. microphylla*, Vatke.

312. Leucas (Loxostoma) Coleæ, *Baker* [Labiatæ]; perennis, caule brevi erecto ramoso pubescente, foliis breviter petiolatis ovatis acutis crenatis utrinque viridibus pubescentibus, verticillastris densis multifloris, pedicellis brevissimis, bracteis longis linearibus ascendentibus conspicue ciliatis, calycis tubo subcylindrico piloso 10–costato ore obliquo latere inferiore producto dentibus parvis deltoideis cuspidatis, corollæ tubo cylindrico calyci æquilongo labio superiore oblongo parvo extus dense piloso labio inferiore minore, staminibus corollæ labio superiori æquilongis.

Habitat.—Somali-land: Golis range, *Miss Edith Cole*.

Folia 6–9 lin. longa. *Bracteæ* propriæ 3 lin. longæ. *Calyx* 4 lin. longus. *Corolla* 6 lin. longa.

313. Paronychia (Anoplonychia) somaliensis, *Baker* [Illecebraceæ]; perennis, dense cæspitosa, foliis sessilibus linearibus acutis glabris rigidulis ascendentibus, stipulis magnis albis lanceolatis scariosis, floribus in capitula terminalia globosa aggregatis, bracteis magnis albis ovatis acutis scariosis albis flore longioribus, perianthii segmentis 5

oblongo-lanceolatis acutis rigidis pubescentibus viridibus albo-marginatis, staminibus perianthio duplo brevioribus, ovario parvo ovoideo.

Habitat.—Somali-land: Golis range at Wardie, *Miss Edith Cole, Mrs. Lort Phillips.*

Folia 2–3 lin. longa. *Perianthium* 1–1½ lin. longum. *Bracteæ* 3 lin. longæ.

Near *P. capitata*, Lam.

314. Jatropha palmatifida, *Baker* [Euphorbiaceæ]; fruticosa, glabra, stipulis subulatis rigidis apice glanduliferis, foliis longe petiolatis profunde palmatifidis lobis 5 oblongo-oblanceolatis obtusis dimidio superiore dentatis inferne integris ad basin attenuatis, petiolo nudo, floribus in paniculam longe pedunculatam ramulis apice dense cymosis dispositis, bracteis oblongis pectinato-serratis dentibus apice glanduliferis, sepalis oblongis acutis, petalis ovatis acutis calyce duplo longioribus, fructu globoso nudo trilobato, stylis ad basin liberis.

Habitat.—Somali-land: Golis range, *Mrs. Lort Phillips.*

Folia 2 poll. longa, 3 poll. lata. *Petala* 1½ lin. longa.

315. Habenaria (Bonatea) Phillipsii, *Rolfe* [Orchideæ]; herba elata, foliis caulinis sessilibus oblongis v. elliptico-oblongis acutis v. abrupte et brevissime acuminatis, racemis circa 7-floris, bracteis ovato-lanceolatis acuminatis, sepalo postico late lanceolato acuto, lateralibus petalorum lobis anticis labello et processubus stigmaticis elongatis omnibus adnatis, sepalis lateralibus sursum explanatis triangulari-falcatis apiculatis deflexis, petalis profunde bipartitis lobo postico libero falcato-lineari lobo antico elongato-lineari, labello trifido lobis linearibus intermedio breviore, calcari elongato pedicello longiore supra medium paululo dilatato, columna brevi, rostello galeato apiculato basi incurvo antheræ basi adnato et in lobos 2 laterales longissimos rectos ascendentes producto, anthera erecta, loculis parallelis, polliniis lineari-oblongis, caudiculis longissimis filiformibus, processibus stigmaticis spathulatis.

Habitat.—Somali-land: Golis range, at Dara-as, in deep gorge near water, *Mr. E. Lort Phillips.* "Flower white and green."

Herba 2 ped. alta. *Folia* 2–5 poll. longa, ¾–1½ poll. lata. *Bracteæ* 1–1¼ poll. longæ. *Pedicelli* 2½ poll. longi. *Sepala* 10 lin. longa, posticum 3 lin. latum, lateralia 4 lin. lata. *Petalorum* lobus posticus 10 lin. longus, anticus 1¾ poll. longus. *Labellum* 2½ poll. longum. *Calcar* 3½ poll. longum. *Rostellum* 3 poll. longum, lobi laterales 8 lin. longi. *Anthera* 4 lin. longa. *Stigmatis* processus 11 lin. longi.

A fine species belonging to the section *Bonatea*, and allied to *Habenaria Kayseri*, Kränzl., from the Usambara district.

316. Hæmanthus (Gyaxis) somaliensis, *Baker* [Amaryllideæ]; caule foliifero breviter producto, foliis tribus membranaceis oblongis acutis ad basin angustatis, venis primariis venulis copiosis transversalibus sæpe anastomosantibus connexis, scapo elongato, bracteis oblongis membranaceis diu ascendentibus, pedicellis elongatis, perianthii tubo cylindrico lobis subulatis ascendentibus tubo æquilongis, staminibus perianthii lobis longioribus filamentis filiformibus rubellis antheris parvis oblongis luteis, fructu globoso glabro.

Habitat.—Somali-land; top of Golis range, alt. 5900 ft., *Miss Edith Cole, Mrs. Lort Phillips.*

Folia synanthia, semipedalia, 2 poll. lata. *Scapus* 5–8-pollicaris. *Bracteæ* 15 lin. longæ. *Corollæ* tubus 3–4 lin. longus. *Filamenta* 9 lin. longa. *Fructus* magnitudine pisi.

Nearly allied to the well-known *H. puniceus*, L. of the Cape.

317. **Vellosia (Xerophyta) acuminata**, *Baker* [Amaryllideæ]; fruticosa, foliis sessilibus linearibus acuminatis rigide coriaceis costa marginibusque incrassatis stramineis venis 10–12 crebris inter costam et marginem præditis, scapo gracili elongato viscoso, ovario oblongo nigro-viscoso, perianthii lobis oblongo-lanceolatis albis dorso glandulosis, staminibus 6 perianthio duplo brevioribus.

Habitat.—Somali-land: Golis range, in rocky watercourses near Woob, *Miss Edith Cole*, *Mrs. Lort Phillips*.

Folia pedalia, inferne 4 lin. lata. *Perianthii* lobi 8–9 lin. longi.

318. **Chlorophytum tenuifolium**, *Baker* [Liliaceæ]; foliis basalibus 5–6 linearibus elongatis membranaceis glabris interdum crispatis, scapo elongato nudo simplice, racemo laxo cylindrico, pedicellis brevibus erecto-patentibus apice articulatis, bracteis minutis ovato-lanceolatis, perianthii segmentis linearibus albis viridi-carinatis, filamentis subulatis elongatis antheris lanceolatis parvis, ovario globoso stylo elongato, fructu globoso acuto angulato apice emarginato.

Habitat.—Somali-land: Golis range, at Widaba, *Miss Edith Cole*, *Mrs. Lort Phillips*.

Folia pedalia vel sesquipedalia, 4–6 lin. lata. *Racemus* demum subpedalis, pedicellis inferioribus 2–3 lin. longis. *Perianthium* 5 lin. longum. *Fructus* 4 lin. diam.

319. **Ornithogalum (Beryllis) sordidum**, *Baker* [Liliaceæ]: foliis pluribus elongatis linearibus synanthiis glabris, scapo elongato, racemo multifloro superne denso inferne laxo, pedicellis brevibus ascendentibus vel patulis, bracteis linearibus persistentibus, perianthii segmentis oblongis dorso viridibus margine albidis, staminibus perianthio paulo brevioribus filamentis conformibus linearibus antheris parvis luteis, stylo ovario oblongo æquilongo stigmate capitato.

Habitat.—Somali-land: Golis range, Woob, *Miss Edith Cole*.

Bulbus ignotus. *Folia* pedalia vel sesquipedalia, inferne 3–4 lin. lata. *Pedunculus* sesquipedalis et ultra. *Racemus* semipedalis. *Perianthium* 3 lin. longum.

Near *O. Eckloni*, Schlecht.

320. **Iphigenia somaliensis**, *Baker* [Liliaceæ]; caule elongato flexuoso gracili glabro, foliis caulinis 8–10 sessilibus linearibus acuminatis graminoideis glabris superioribus sensim brevioribus, floribus in axillis foliorum superiorum solitariis pedunculis brevibus erectis, perianthii segmentis 6 subulatis viridibus flore expanso patulis, staminibus ovario brevioribus antheris parvis oblongis, ovario oblongo stylis tribus brevibus falcatis, fructu obovoideo trilobato apice emarginato perianthio breviore.

Habitat.—Somali-land: Golis range, near Widaba, *Miss Edith Cole* *Mrs. Lort Phillips*.

Bulbus ignotus. *Caulis* pedalis. *Folia* majora 6–8 poll. longa inferne 2 lin. lata. *Perianthium* 6 lin. longum.

Very near the Indian and North Australian, *I. indica*, Kunth.

321. **Cyanotis somaliensis**, *C. B. Clarke* [Commelinaceæ]; sericeo-villosa, foliis oblongis apice breviter triangularibus apiculatis, spicis terminalibus ac pluribus axillaribus distantibus sessilibus.

Habitat.—Somali-land: *Mrs. Lort Phillips, Miss Edith Cole.*

Caules centrales steriles abbreviati, laterales 6–12 poll. longi, spicis axillaribus 5–10 distantibus. *Folia* 1½ poll. longa, ⅔ poll. lata, plana, apice parum acuminata. *Capsula* non visa.

Very near the South African *C. nodiflora* Kunth, but the leaves do not match any of this group—they resemble those of *C. cristata*, Roem. et Schult.

322. **Kyllinga microstyla**, *C. B. Clarke* [Cyperaceæ]; pergracilis, spicis 3, spiculis numerosis minimis 1–floris, stylo vix ullo ramis ⅓ nucis vix æquilongis, nuce lateraliter compressa gluma fere æquilonga.

Habitat.—Somali-land: *Mrs. Lort Phillips.*

Glabra. *Culmi* cæspitosi, 3–6 poll. longi, basi vaginis pluribus angustis incrassati. *Folia* plura, ½ culmi æquilonga, ½ lin. lata. *Bracteæ* 3, patulæ, ima 2 poll. longa. *Spica* centralis 2 lin. longa, 1 lin. lata, 2 laterales 1 lin. longæ et latæ. *Spicula* ½ lin. longa, lateraliter compressa, 3–gluma, decidua, viridis. *Stamina* 2–1, antheræ breviter oblongæ. *Nux* obovoideo-ellipsoidea, obtusa, levis.

Resembles exceedingly small examples of *K. triceps*, Rottb.

323. **Cyperus somaliensis**, *C. B. Clarke* [Cyperaceæ]; culmo tenuiore monocephalo, foliis ⅓—¾ culmi æquilongis setaceis vaginis minute dense pubescentibus, spiculis parvis ovoideis compressis albo-luteis 4–8–floris in unicum caput dense compositis, stylo 3–fido, nuce triquetra obovoidea ⅔ glumæ æquilonga.

Habitat.—Somali-land: *Mrs. Lort Phillips, Miss Edith Cole.*

Culmi 4–6 poll. longi, basi vaginis indurati, in rhizomate perbrevi glomerati. *Folia* modo fere glabra, modo dense pubescentia. *Caput* ⅓ poll. in diam.; bracteæ 2, inferior 2 poll. longa. *Spiculæ* ⅙—¼ poll. longæ. *Glumæ* obtusæ, multistriatæ, tenues. *Antheræ* lineari-oblongæ, luteæ, exsertæ, conspicuæ. *Stylus* nuci æquilongus; rami 3 stylo æquilongi. *Nux* inæqualis, curvata, brunescens.

Near *C. leucocephalus*, Retz.

324. **Mariscus somaliensis**, *C. B. Clarke* [Cyperaceæ]; radicibus fibrosis, culmis cæspitosis tenuibus basi vaginis tumidis cylindrice incrassatis monocephalis, spica brevi densa 6–14–stachya, spiculis linearibus 12–16–floris castaneis, glumis valide multistriatis apice lanceolatis subaristatis paullo recurvatis.

Habitat.—Somali-land: *Mrs. Lort Phillips.*

Glabra. *Culmi* 4–8 poll. longi. *Folia* ½–⅔ culmi æquilonga, setacea, debilissima. *Caput* ⅔–1 poll. in diam. *Spiculæ* ½ poll. longæ, 1–1½ lin. latæ. *Nux* non maturata.

Near *M. leptophyllus*, *C. B. Clarke*, but glumes subaristate.

325. **Pellæa lomarioides**, *Baker* [Filices]; dense cæspitosa, paleis basalibus densis linearibus firmulis medio nigris margine brunneis, stipitibus elongatis castaneis minute paleaceis, frondibus oblongis subcoriaceis elasticis bipinnatis facie viridibus glabris, rachibus paleaceis, pinnis lanceolatis sessilibus basalibus exceptis simpliciter

pinnatis basalibus basi furcatis, lobis linearibus integris, venis immersis occultis, indusio lato continuo brunneo persistente glabro crenulato.

Habitat.—Somali-land: Golis range, in rocky gorges at Dara-as, alt. 5000 ft., *Miss Edith Cole, Mrs. Lort Phillips.*

Stipes 2–5 poll. longus. *Lamina* 3–6 poll. longa, 2–3 poll. lata.

Habit of *Cheilanthes farinosa*, Kaulf. The persistent indusia meet almost edge to edge at the midrib.

CCCCLXXVI.—SHU-LANG ROOT.

(*Dioscorea rhipogonoides*, Oliver.)

Plants belonging to the monocotyledonous order *Dioscoreaceæ* consist of climbing shrubs of which the black bryony (*Tamus communis*) with an acrid tuber and red berries is a familiar example. In the tropics the typical genus is *Dioscorea* producing the fleshy tuberous roots known as yams. These are widely cultivated and form the chief food in many tropical and sub-tropical countries. In China a *Dioscorea* described below is known as a "dye yam." We are indebted to Dr. Augustine Henry, F.L.S., who has already done so much for Chinese Botany, for the following particulars:—

Note on Shu-lang.

Dioscorea rhipogonoides, Oliver, was first discovered by Mr. Ford in Hong Kong, and is described in *Hooker's Icones Plantarum, tab.* 1868. No mention is made there of its economic importance, and I believe it was not until Mr. Ford made his excursion up the Canton river that he became aware of the use of the root as a dye. The Chinese hunt for it in Hong Kong, and little of the plant is left there on that account.

In Formosa the plant occurs plentifully in the mountains; and the roots are brought to the coast, where they are much used by fishermen for dyeing and tanning their nets. I am not aware that any export occurs from Formosa.

The root (and plant as well) is known to the Chinese as *shu-lang*, and occurs in commerce as "dye-root" or "dye-yam"; while in Tonkin the French apply to it the name *faux gambier*. The Customs Trade Report for Pakhoi, 1882, says it is imported there from Annam, being a tuberous root called *shu-lang* or *faux gambier*. It is extensively used at Pakhoi in dyeing coarse native cotton cloth and fishing nets a dark brown or tan colour.

The lately opened Customs station on the Kwangsi-Annam frontier, Lungchow, is at present the seat of the trade; and the following quotations are from Customs Trade Reports on that port for the years 1889 and 1891.

"The principal article imported into Lungchow in 1889, was *shu-lang*, 3,709 piculs, value 4,437 taels (over 200 tons, 1,100*l*). It is a tuberous root growing wild in the hilly districts of Tonkin. It is now to a certain extent cultivated, but cultivation, strange to say, deteriorates the quality. It is usually gathered in spring and early summer and is sent from here down the West River to Canton, where it is used to dye

cloth that peculiar reddish black colour one so often sees in the South. The value locally ranges from $1\frac{1}{2}$ to $3 a picul."

"In 1891, the imports into Lungchow from Tonkin (districts of Thatke and Caobang) of *shu-lang* or *faux gambier* was 9,000 piculs, valued at 16,762 taels (over 500 tons, value 4,000*l*.)" The 1889 and 1892 Reports give some further details as to the trade.

At Canton, the root is chiefly used for dyeing grass-cloth (*i.e.*, the light fabric made from *Bœhmeria*) and the kind of silk material known as *Cantons*, both used much for summer clothing.

In the Chinese Illustrated Botany (*Chih-wu-ming*, IX., 26) *shu-lang* is figured and said to occur plentifully in the mountains of Fukien, Kwangtung, and Kwangsi provinces. Its uses are described to be for dyeing fishing nets. The Chinese author says the stem has small thorns and that the root is hairy. He is perhaps speaking of another species.

The specimens now sent are Formosan roots, and are, I think, unquestionably *Dioscorea rhipogonoides*. The leaf specimens, No. 105, were attached to the root, so that there is no doubt about these specimens.

Mr. Ford is sure that the Canton root is from the same plant. I have no specimens at present of Annamese *shu-lang*; these could be procured from Pakhoi or Canton.

Takow, 14 March 1894. AUGUSTINE HENRY.

CCCCLXXVII.—MISCELLANEOUS NOTES.

The news has reached Kew of the death at the General Hospital, Madras, on the 17th August, of Mr. ANDREW JAMIESON, Curator of the Gardens and Parks at Ootacamund, Nilgiris. Mr. Jamieson was 53 years of age, and had been connected with the Ootacamund Gardens for nearly 27 years. He was formerly a member of the gardening staff at Kew and was appointed to Ootacamund in September 1868. He was in sole charge of the gardens on the Nilgiris for many years until they were placed under the control of the present Director.

Mr. Jamieson was a skilful and capable officer and his official reports were full of valuable information. On taking over charge of the Department in 1883, Mr. M. A. Lawson, M.A., the Director, bore the following testimony to Mr. Jamieson's services:—"I wish especially to record my obligations to the Curator, Mr. Jamieson, for the loyal manner in which he has on every occasion supported me in designing the alterations I wished to introduce, and for the skill and perseverance which he has evinced in carrying out those alterations to a satisfactory conclusion."

MR. JOHN HORNE STEPHEN, formerly of Kew, and lately Curator of the Lal Bagh Botanic Gardens at Bangalore, Mysore, has been appointed Superintendent of the Public Gardens at Nagpur, Central Provinces of India, in succession to the late Mr. J. R. Ward. Mr. Ward died in January last from smallpox complicated with other maladies. He had only held his post since 1893, but had already won general regard; his untimely death has cut short a career of promise.

Botanical Magazine.—The number for August contains figures of two orchids, namely, *Saccolabium mooreanum*, from New Guinea, and *Pleurothallis Scapha*, from tropical America, but from what part is uncertain. The latter, one of the most elegant of the genus, was contributed by Mr. Moore, the Keeper of the Glasnevin Gardens, after whom the former was named. *Prochynanthes bulliana*, is the first figure published of a member of this singular genus of *Amaryllideæ*. It is a native of Mexico, whence it was introduced by Mr. William Bull, of Chelsea, who presented a plant to Kew, where it flowered last summer. *Spiræa bracteata*, a Japanese species, cultivated under various names, including *S. media*, var. *rotundifolia*, was drawn from a plant that flowered in the Arboretum last year. *S. media*, F. Schmidt, is, however, erroneously cited as a synonym. *Pyrus sikkimensis*, is an interesting species that has long been in the Arboretum, having, probably, as Sir Joseph Hooker supposes, been raised from seed sent home by him in 1849.

Herbaceous List:—A hand-list of herbaceous plants cultivated in the Royal Gardens, Kew, was issued in June last. The following account of the origin and development of the collection is given in the preface:—

The object of the present hand-list as with the rest of the series is, in the first place, to show what species are actually grown at Kew, and in the next to reduce, if possible, the nomenclature in use in gardens to something like a standard.

In the earlier Botanic Gardens the collections consisted necessarily entirely of plants grown in the open air. "Indoor cultivation" did not commence till about the middle of the seventeenth century. The greenhouse and hothouse in the Chelsea Botanic Gardens were probably amongst the earliest erected in this country.

The cultivation of herbaceous plants in the open air, or with merely winter shelter in frames, still remains one of the most important features of Botanic Garden work. Of the total number of species cultivated at Kew probably not less than a quarter are grown in this way.

The first collection of herbaceous plants at Kew was formed by William Aiton, who was engaged by the Dowager Princess of Wales to establish a botanic, or as it was then called, a physic garden. It was begun in 1760 and occupied about an acre of the southern part of the original botanic garden. The site which it occupied is immediately south of the Temple of the Sun. It was arranged on the Linnean system. According to an enumeration made by Mr. John Smith, the first curator of that name, in "Hill's Hortus Kewensis, published in 1768, the number of the Kew collection of herbaceous plants was 2712," while Aiton, "in his Hortus Kewensis, published in 1787, enumerates 2824 species."

In 1846 the Royal Kitchen Garden, "an extent of 14 acres or thereabouts," that ran parallel to the Richmond Road was abolished. Sir William Hooker states in his report for that year "several useless transverse fruit walls have been removed, and the greater portion of this area is being prepared for the reception of the entire hardy herbaceous collection; it is proposed to retain the two long (eastern and western) walls for climbing and tender plants, and new walls have been formed or are being formed with that object."

The work was carried out by the foreman, James Niven, afterwards Curator of the Botanic Garden, Hull. In 1853 a catalogue drawn up by him was printed, which enumerates 5494 names of species. These, however, include many shrubs, greenhouse plants, and ferns, as well as a large number of plants entered twice under synonymous names. A deduction of at least 1000 names must be made to arrive at the actual number of herbaceous plants cultivated at the time at Kew.

In 1867 the small rockery now devoted to hardy ferns was constructed "of Reigate sandstone," and "furnished with about 300 Alpine plants." In 1873 this was re-arranged, and in 1874 "about 560 species of Alpine plants were grown upon it."

This was, however, regarded as a very inadequate representation of a branch of horticulture which had become very popular, and in 1881 a memorial was addressed to Her Majesty's Office of Works in which "the formation of a rock garden on a sufficiently important scale" was warmly urged. The matter was under consideration when it was "brought to an issue by the gift on the part of the executors of the late George Curling Joad, Esq., F.L.S., of Oakfield, Wimbledon Park, in accordance with the wishes expressed by him before his death, of the entire collection of herbaceous plants cultivated at Oakfield."

A sum of 500*l.* was granted by the Treasury for the formation of the present rock garden which was constructed on the vacant piece of ground adjacent to the herbaceous ground. Part of the rock used was weathered oolite obtained from Bath: part weathered mountain limestone from the Cheddar Cliffs. For the rest use was made of the materials of "an overgrown and neglected rockery (Stonehouse Ruins) dating from the time of George III.," in the Arboretum, south of the Temperate House.

Mr. Joad's collection of plants amounted to 2630 specimens, and had been got together at great pains and expense. It pretty well furnished the new rock garden: it has since been continuously added to.

A rock garden is, however, unsuitable for the cultivation of Alpine plants from the higher levels. To these the dampness of an English winter in the open air is in the vast majority of cases fatal. Again, in an English spring the plants flower too early and suffer severely from its harshness. They can only be successfully wintered in frames, which take the place of their natural covering of snow. The extensive collection is maintained under these conditions at Kew, and when in flower shown in the Alpine House adjoining Museum No. II. This, which is unheated, was erected in 1887 and enlarged in 1892.

For continuous aid in the increase and maintenance of the collection of Alpine plants Kew is greatly indebted to G. C. Churchill, Esq., who for several years has conducted an assiduous correspondence on its behalf with collectors in all parts of Europe.

The tank for aquatic plants immediately in front of the Jodrell Laboratory was constructed in 1873.

The wild garden adjoining the Cumberland Gate was planted in 1882.

Mention must be made of the Kew collection of bulbs. These, though largely used to produce a decorative effect in the spring, are in great measure of botanical interest. They have for the most part been grown at Kew since 1886 from a small original stock by the same methods as are employed in Holland. At the beginning of summer they are lifted, harvested, and planted out again the following autumn.

The collection of crocuses is mainly the gift of George Maw, Esq., F.L.S.

For constant and liberal contributions of bulbs of all kinds Kew is indebted to Edward Whittall, Esq., of Smyrna.

The collection of herbaceous plants is intended for inspection and it is not permitted to gather specimens. To meet the special wants of students a limited collection, where this restriction is not enforced, was made in 1880 on the ground adjoining the Herbarium. Admission to this "Students' Garden" may during the summer months be obtained on application at the Curator's office on Kew Green.

The total number of herbaceous flowering plants now in cultivation at Kew is approximately 6000, including 1000 well marked varieties.

Since 1885 lists of seeds available for exchange with other botanical establishments have been issued annually.

British Fungus-Flora.—The fourth volume of Mr. G. Massee's new Fungus-Flora has appeared. In this volume the three families *Gymnoascacea*, *Hysteriacea*, and *Discomycetes* are reviewed, and illustrated by upwards of 300 figures. Altogether 113 genera and 702 species are described and classified, as follows: *Gymnoascacea*, 3 genera and 10 species; *Hysteriacea*, 13 genera and 32 species; and *Ascomycetes*, 97 genera and 660 species. The genera *Ostreion* and *Masseea*, previously only recorded from America, have been added to the British list.

Pay of Employés.—On the recommendation of the First Commissioner of Her Majesty's Works and Public Buildings, the Treasury has agreed to the minimum wage at Kew being raised to 21*s*. In addition to this both labourers and gardeners receive gratuitous medical attendance during sickness, sick pay according to length of service and extra pay when employed on Sundays. On the other hand retirement at 60 is compulsory, and pensions in the shape of "compassionate allowances" are abolished by the Superannuation Act, 1887, which only allows a gratuity of one week's pay for each year of service.

It will be interesting to trace the gradual rise of wages at Kew since 1841, when it became a national establishment.

Year.	Labourers.	Gardeners.
	s.	*s.*
1841	12	12
1847	14	—
1865	15	14
1873	17	16
1885	—	18
1889	18–20	—
1894	19–20	—
1895	21	21

South Wing of Temperate House.—The erection of this was sanctioned by the Treasury last year (*Kew Bulletin*, p. 398). The care required in the preparation of the detailed working drawings and the securing the necessary contracts as soon as the supplementary estimate had been passed by the House of Commons, prevented the work being immediately taken in hand. The contractor, however, commenced work on the site on August 19, and building is being pushed on with all possible speed. It is hoped that the new wing will be completed by the middle of next year.

Wire Fence.—The removal, by the gracious permission of Her Majesty the Queen, of the fences excluding the public from the Palace Meadow was announced in the *Kew Bulletin* for March (p. 75). Since then the First Commissioner of Her Majesty's Works and Public Buildings has authorised the removal of the wire fence which since 1844 has separated the Botanic Garden from the Arboretum. As for many years there has been no difference in the administration of the two areas, which are equally devoted to botanical purposes, the fence had become devoid of any practical object. And the four gates, by which alone it could be passed, had become wholly inadequate to the convenient movement of the large crowds which now frequent the Royal Gardens in fine weather.

Injury by Lightning.—The Royal Gardens have long enjoyed an immunity from the effects of lightning, thunder storms rarely passing over them. Unfortunately this can no longer be said to be the case. On the night of Saturday, August 10, a Deodar, 45 ft. high, the most graceful and symmetrical which Kew possessed, growing between the Palm House and the Pagoda Vista, was completely destroyed. This was the more remarkable, as though standing alone it was in the neighbourhood of higher trees. The top of the tree for 17 feet was apparently uninjured, though severed from the trunk as if by the blow of an axe. The rest of the trunk below this was shivered into fragments.

On August 22 following the top of the Water Tower was struck, and sustained serious damage.

In 1889 the Herbarium and flag-staff were provided with the best appliances for protection from lightning, under the direction of W. H. Preece, Esq., C.B., F.R.S. And in 1894 these were also furnished to Museum No. I.

International Geographical Congress.—At the request of the executive the Director of the Royal Gardens received the foreign and the leading English members of the Congress at the Royal Gardens on August 1st. Of the former about 600 were present, two special trains having been provided for their conveyance from London. By the gracious permission of Her Majesty the Queen, the reception took place at Kew Palace. The foreign members were afterwards taken over the establishment in parties by different members of the staff.

Portrait of Dr. Thomas Thomson.—Sir Joseph D. Hooker has presented Kew with a replica of a portrait of the late Dr. T. Thomson, F.R.S., by G. Richmond, R.A. The portrait was painted in 1852, when Thomson was 35 years of age, and the replica was done at Richmond's house, under his eye, if not actually by himself. Dr. T. Thomson was a son of the celebrated chemist of the same name, and began his active career in the medical service of the Honourable East India Company. In 1847 he was selected to accompany the mission to Tibet, and he was the first botanist to enter the Karakoram mountains. His narrative of the journey was an important contribution to many branches of science. Subsequently he joined Dr. J. D. Hooker, and they botanised together in the Khasia mountains, and on their return to England in 1850, he assisted at Kew in naming and distributing the botanical collections, and in writing the first volume of the *Flora Indica*. He afterwards was appointed director of the Calcutta Botanic Garden, an appointment he held only a few years, returning to England in 1860 in bad health, from which he never recovered, though he lingered on until 1878.

Handbook of the Flora of Ceylon.—The third volume, or third part, as it is designated, of this admirable work has just appeared. It contains the orders *Valerianaceæ* to *Balanophoraceæ*. With it are issued plates 51 to 75. These are of quarto size, and represent interesting or critical species. Dr. Trimen, who is now on leave in this country, is to be congratulated on the rapid progress of his undertaking. For further particulars see *Kew Bulletin*, 1894, p. 34 and p. 227.

Cultivation of Plantains in British Guiana.—In the report on the agricultural work in the Botanical Gardens at Georgetown for the year 1890, it is stated that "plantains being the staple food of the creole population, the cultivation is a firmly established minor industry," those who follow it being called "farmers" as distinct from "planters" who cultivate the suger-cane. Plantains are said to "delight in the stiff newly empoldered clay lands of the colony, not objecting to the slightly saline element found where the sea or river has invaded the place periodically at spring tides . . . . Such lands yield heavily but "the crop is liable to suffer, if the seasons prove very wet, from the plantain disease of the Colony." From the report in the Blue Book for 1893–4 published in the *Colonial Reports* No. 133, British Guiana, p. 13, it appears that the cultivation is dying out.

"The cultivatiou of plantains on sugar estates becomes less year by year, and there are now only 1917 acres in plantains, and although many plantain farms of which there is no official record still exist, this vegetable has practically ceased, from its comparitive scarcity, to be the staple food of the African population."

This change cannot fail to prove detrimental to the interests of the Colony. More money will necessarily have to be spent on imported rice and flour, while valuable lands will be left uncultivated capable of yielding large crops of food.

Piper ovatum.—At the request of Kew the leaves and other parts of this plant have recently been the subject of investigation at the Research Laboratory of the Pharmaceutical Society by Professor W. R. Dunstan, F.R.S., and Mr. Henry Garnett. The material was received from Mr. J. H. Hart, F.L.S., Superintendent of the Royal Botanic Gardens, Trinidad.

Piper ovatum, Vahl. (Ottonia Vahlii, *Kth.*) is a herbaceous shrub about 2–4 feet high with large papery leaves. It is found rather abundantly in woods in the central parts of Trinidad and is employed locally as a remedy for snake bite and hydrophobia. When chewed it gives rise to a persistent tingling of the tongue and lips which is followed by a sensation of numbness accompanied by profuse salivation; in these respects resembling pellitory. All parts of the plant, leaves stem and root, possess this property, but the leaves and root appear to act more powerfully than the stem; the leaves have an aromatic taste due to an essential oil which is absent from the root.

The following results are taken from a paper contributed by the investigators to the *Transactions of the Chemical Society*, 1895, pp. 94–100. A small quantity of an almost colourless, volatile, aromatic oil was obtained by distillation from the leaves. This was optically inactive, since a 6 per cent. solution in alcohol produced no rotation of the polarised ray. Without analysis the volatile oil of *Piper ovatum* was regarded as a sesquiterpene. Of the non-volatile constituents the active principle, called *Piperovatine*, forms colourless, light needles, which often crystallise in rosettes. In appearance these somewhat resemble the alkaloid caffeine. In strong alcohol the highly purified substance has the curious property of apparently gelatinising when water is added to it in just sufficient quantity to cause precipitation. Further investigations will probably show that the constitution of piperovatine is precisely similar to that of such alkaloids as piperine, atropine, and aconitine. As regards its physiological action according to Professor Cash, F.R.S., of Aberdeen, it acts as a temporary depressant of both motor and sensory nerve fibres and also of sensory nerve terminations producing local anæsthesia. The authors sum up the results, so far obtained, in the following words:—"In attempting to utilise the local anæsthetic effect of piperovatine the want of penetrating power, the temporary character of its action, and, above all, its property of causing salivation, have interfered with its successful employment in the minor operations of dentistry. The solution of piperovatine in almond oil has, however, given promising results in affording temporary relief in painful superficial lesions." It is added that there is a strong resemblance between the physiological action of piperovatine and that of the root of pellitory.

Preservation of Books in the Tropics:—In the *Kew Bulletin*, 1894, pp. 217, 218, an extract was given from *India Museum Notes*, Vol. iii. No. 3, on the best means for preserving books from the ravages of insects in the tropics. On this subject the following letter has been received from Surgeon-General George Bidie, C.I.E., formerly in charge of the Government Central Museum, Madras:—

Berry View, Paignton, South Devon,
19th March 1895.

Sir,

In the *Kew Bulletin* for 1894, p. 217, there is a memorandum on the "Preservation of Books in the Tropics," and I now write to

mention that so far as their protection from insect enemies is concerned, the subject was investigated by me years ago, when in charge of the Government Central Museum, Madras, and the practical outcome of the experiments recorded in the Museum Annual Reports for 1881 (p. 6) and for 1883 (p. 4). Indeed, it may be affirmed that the application of corrosive sublimate for the protection of books from tropical insects was first devised by the staff of the Madras Museum, and thereafter regularly used for the books in the scientific and large public libraries which it contains. Before bringing it into use it was carefully tested by placing books and papers poisoned with it in the nests of white ants, the most formidable of all the enemies of literature, and it was invariably found that the articles thus exposed came out of the ordeal uninjured. The composition of the Madras preservative was as follows :—

Corrosive sublimate - - - -	1 oz.
Carbolic acid (Calvert's) - - -	1 oz.
(or Thymol, $\frac{1}{4}$ oz.)	
Methylated spirits - - - -	2 pints.

This mixture was carefully and freely applied with a soft brush about the bindings and amongst the leaves of the books, the eyes of the operator being protected with close fitting goggles. It dried quickly and was perfectly safe, as I have never seen or experienced any disagreeable effects from handling books poisoned with it.

My impression is that the value of this preservative was made known to all public departments by Government circulars, but apparently these never penetrated so far as Calcutta.

I am, &c.,
(Signed) G. Bidie.

W. T. Thiselton Dyer, Esq., C.M.G., &c.,
Director, Royal Gardens, Kew.

Gum Tragacanth.—In a Foreign Office Report (No. 1624, Annual Series, 1895) on the agricultural condition of the Vilayet of Angora, Turkey, the following account is given by Consul Cumberbatch of "Kitré" or gum tragacanth, a partially soluble gum obtained from species of *Astragalus*.—"It is known in commerce as fine white 'Syrian' tragacanth, and appears as 'leaf-sorts' and 'vermicelli.' It has the appearance of twisted ribbons, is white and reddish, nearly opaque, and a little ductile. Its adaptability in lieu of borax for giving lustre to starched linen is perhaps not generally known. The districts where the shrub is chiefly found are Yozgat, Iskilip, Cesarea, Kaledjik, and Angora. Like the yellow berry (the fruit of *Rhammus infectorius* described in the Museum Guide, I., p. 36) this plant is also neglected owing to the falling-off in the foreign demand, and though abundant in the above-mentioned districts little or no trouble is taken by the peasants to collect the gum ; this is done by men specially sent from other parts. It is found growing wild in the fields, on the road sides, and even in hilly parts. On account of its prickly nature animals avoid it, but it is frequently gathered for fuel by the peasantry."

Particulars of gum tragacanth may be found in Museum Guide, I., pp. 45, 46. The gum is not simply the juice of the plant hardened by exposure, "but a more or less complete transformation of the cells of

the pith and medullary rays of the stem into a mucilaginous mass." Good botanical specimens of tragacanth-yielding species, with information on the mode of collecting the gum, are much wanted at Kew.

Zinc in dried Apples.—In a recent Consular Report furnished to the Government of the United States, it is stated that "for a number of years dried apples in the form of slices, pieces, or rings, have been imported into Germany from the United States, and it has been observed that this fruit often contains zinc in such quantities that, according to medical authority, the consumption of it may be detrimental to health. The German authorities have, in consequence, endeavoured by every possible means to prevent the importation of American dried fruits containing zinc and to bring about the judicial punishment of the vendors of such merchandise." It is shown that the zinc gets into the apples during the drying process and is due to the use of zinc plates or trays in the fruit evaporators, the acid of the apples chemically combining with the zinc forming a malate of zinc. The use of zinc plates is said to give the dried apples a fine light colour, but as stated in the report "it would not seem to be advisable to employ such means for the sake of a comparatively small and purely external advantage." In place of zinc plates it is recommended that racks or frames of wood be used, or that the apple-slices be dried upon strings or cords. These methods "are often employed in Germany, and therefore the brownish colour of the products obtained through them would not put them to any disadvantage so far as their importation into Germany is concerned."

White Willow.—The Huntingdon or White Willow (*Salix alba*, L.), so called from the silky whiteness of the underside of the leaf, is a native of Britain and extends to Europe, North Africa, North-west India and Western Asia. It grows rapidly and attains a large size. Exceptional trees are described as "80 feet high with a trunk 20 feet in girth." The leaves are narrowly lanceolate, silky on both sides when young. The catkins appear with the leaves and are slender and lax. The bark is used for tanning and it yields the medicine salicine. The timber is valuable for a variety of purposes such as turnery, mill work, coopering, and cricket bats. The charcoal is excellent for the manufacture of gunpowder and for crayons,

The favourite localities for the growth of the White Willow "are low shelving banks of streams and rivers, riverine tracts subject to occasional inundation with water holding rich mud and silt in solution, and fresh or damp meadow land whose soil moisture is not stagnant." It grows also in uplands not subject to inundations, and is occasionally planted as an ornamental tree in woods. It is extensively planted as a pollard tree, but in this case it is not so valuable for timber purposes. The demand for good white willow suitable for bat-making appears to be increasing, while the supply is falling off. Several inquiries have been made at Kew on the subject. Recently a letter was received from Mr. A. Dye, a cricket-bat maker of Sydney, New South Wales. He states "I have experienced great difficulty in obtaining the particular kind of Willow required in my business, viz., *Salix alba* . . . I have repeatedly

ordered white willow from various firms in England and have never yet received the right suff. I now feel certain they do not know where to obtain it."

A firm of timber merchants in the City writes: "We have made several inquiries, but find that the demand for white willow is so great that there is considerable difficulty in procuring any, the large bat makers having always men scouring the country trying to pick up what they can. One man, however, has been in to-day to offer us some. The price would be 5*s*. per cubic foot where the wood lies. It seems a very long price, but most of our friends tell us we should not be able to get any at all."